



National Transportation Safety Board

Enhancing Aviation Safety: NTSB Fatigue Investigations and Recommendations

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Board Member

Board of Directors Meeting
Coalition of Airline Pilots Associations
September 17, 2014



- 1) determining the probable cause of transportation accidents**
- 2) making recommendations to prevent their recurrence**



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All Modes



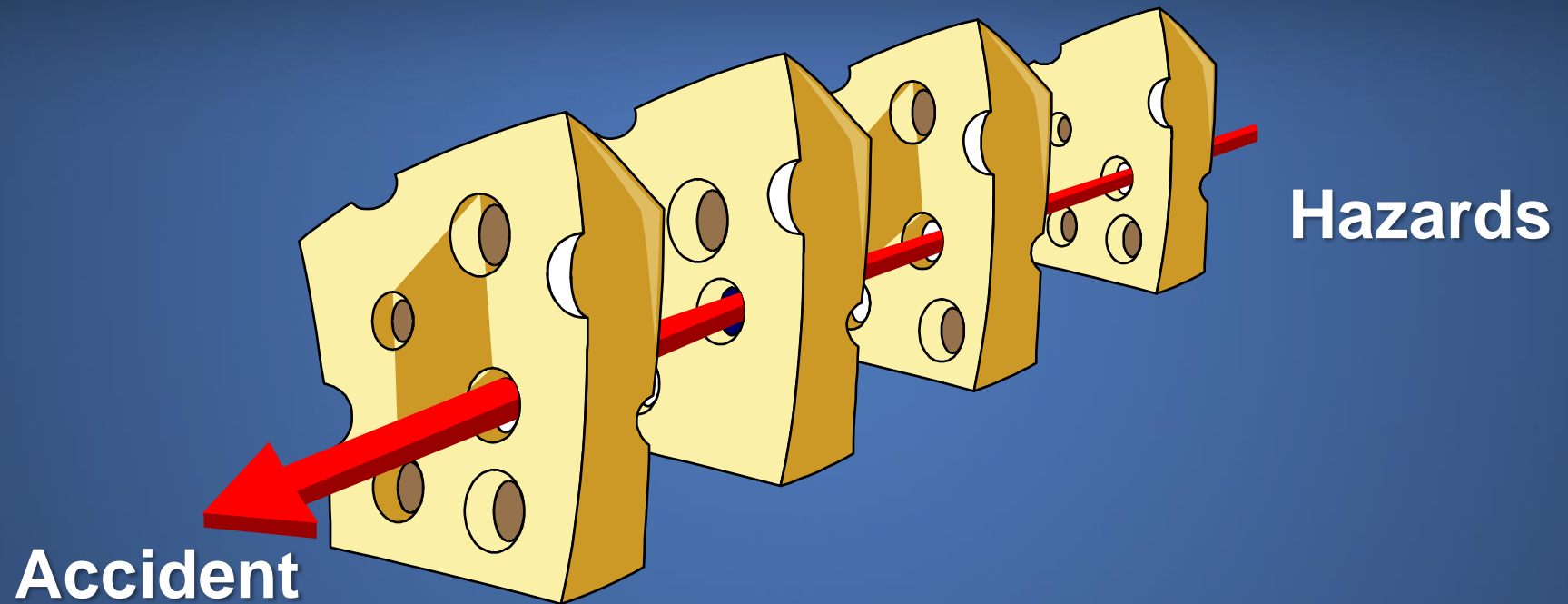
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Independent Federal Agency: Created in 1967

- >140,500 accident investigations
- 14,000+ safety recommendations
- ~ 2,300 organizations/recipients
- 82% acceptance rate



“Swiss Cheese” Model (Reason)



Successive layers of defenses, barriers, and safeguards



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NTSB Go Team: 24/7/365

- Individual investigator
- Regional/limited team
- Major launch/Board Member



Key On-scene Events



Organizational Meeting

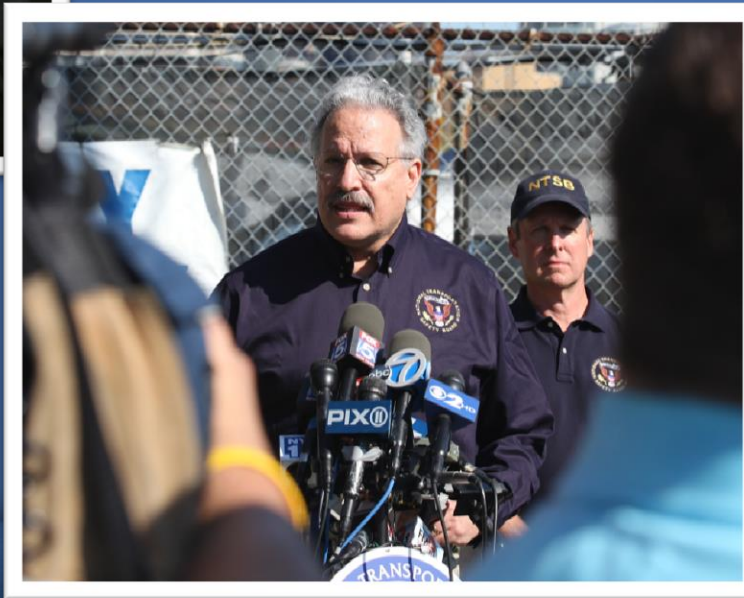
- Designate parties and party coordinators
- Establish and organize groups

Progress Meetings

- Summarize findings
- Info for briefings

Family Briefings

Press Briefings



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NTSB Party System

- NTSB selects parties
(No insurers, claimants, lawyers)
- Bound by rules of engagement
(Responsive to NTSB direction)
- Verify factual reports written by group chairmen

*“...persons, government agencies, companies, and associations whose employees, functions, activities, or products were involved in the accident and who can provide **suitable qualified technical personnel** to actively assist...”*

Party Member Examples

- FAA (always)
- Equipment manufacturer
- Engine manufacturer
- Airline Pilots Association
- Air Traffic Controllers Union



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NTSB Investigative Process



On-scene Investigation

Organizational Meeting
Groups and Parties
Progress meetings
Media Briefings
Press Releases

A screenshot of the NTSB ID CARD (Form 1) for Continental Airlines Flight 3407. The form includes fields for aircraft information, flight details, and a summary of the accident. The accident occurred on February 12, 2009, at Buffalo-Ramapo International Airport (BUF), New York. The aircraft was a Bombardier CRJ-900, registration N3250G. The flight was from Buffalo to Fort Lauderdale. The accident was a controlled flight into terrain (CFIT) during a low-visibility approach.

Preliminary Report

Factual information



Public Hearing

Fact finding
Depositions
Witnesses
Docket



Board Meeting

Docket
Findings
Conclusions
Probable Cause
Safety Recommendations



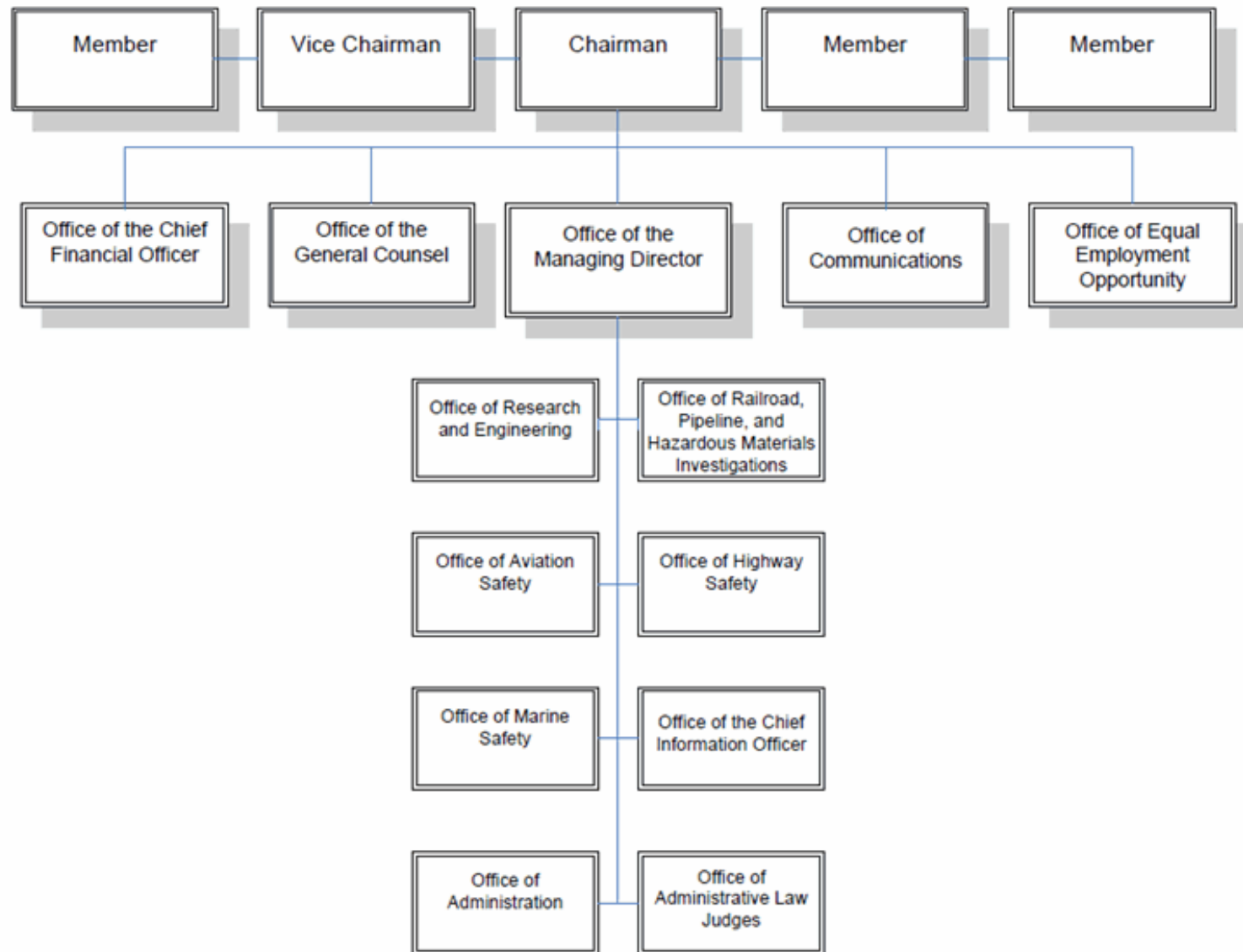
Final Report

Government in the Sunshine Act



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NATIONAL TRANSPORTATION SAFETY BOARD



NTSB: The Board

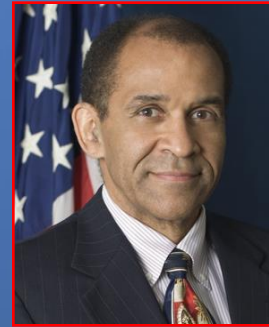
- Five Members:
 - President nominates
 - Senate confirms



Earl Weener
Member



Robert Sumwalt
Member



Chris Hart
Acting Chairman



Mark Rosekind
Member



Honorable John K. Lauber:

No Accident \neq
Safe Operation



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Challenges of a 24/7 Society



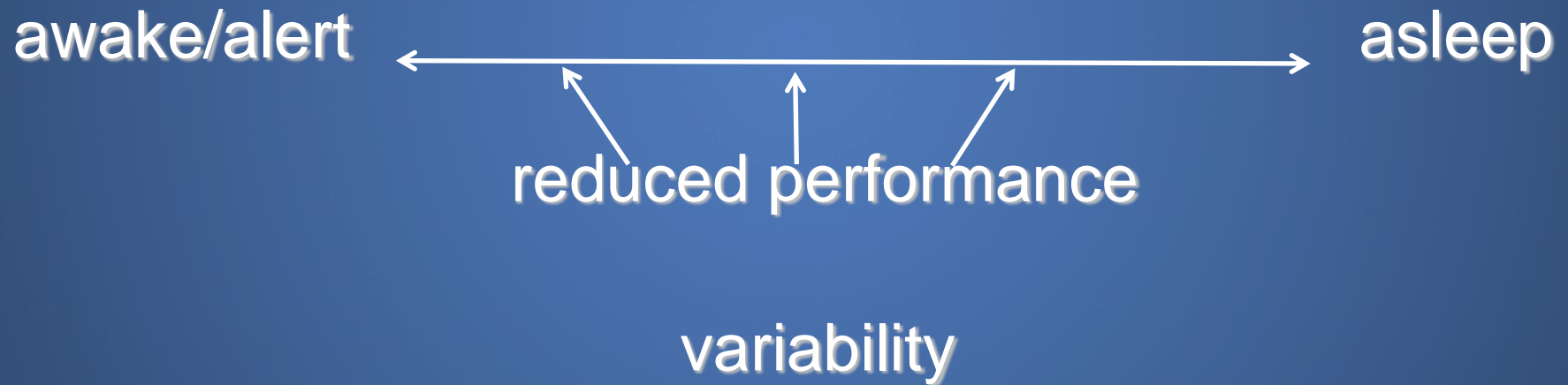
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Four Fatigue Factors +

- Sleep loss
- Continuous hours of wakefulness
- Circadian/time of day
- Sleep disorders
- Other considerations



Fatigue Risks



Fatigue Risks

- degraded 20 – 50%+:

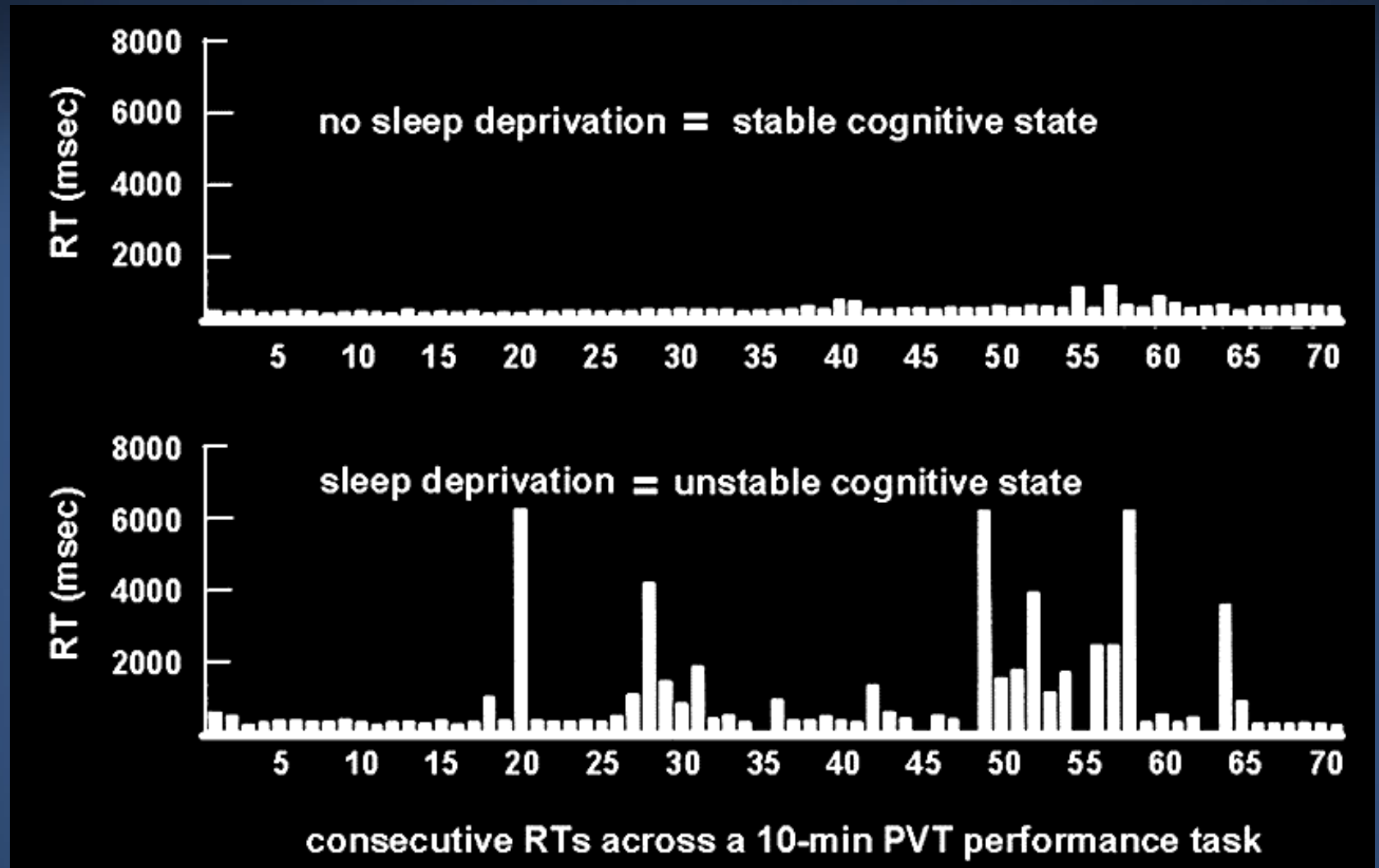
- reaction time
- judgment
- memory
- attention
- communication
- mood
- situational awareness

- increased:

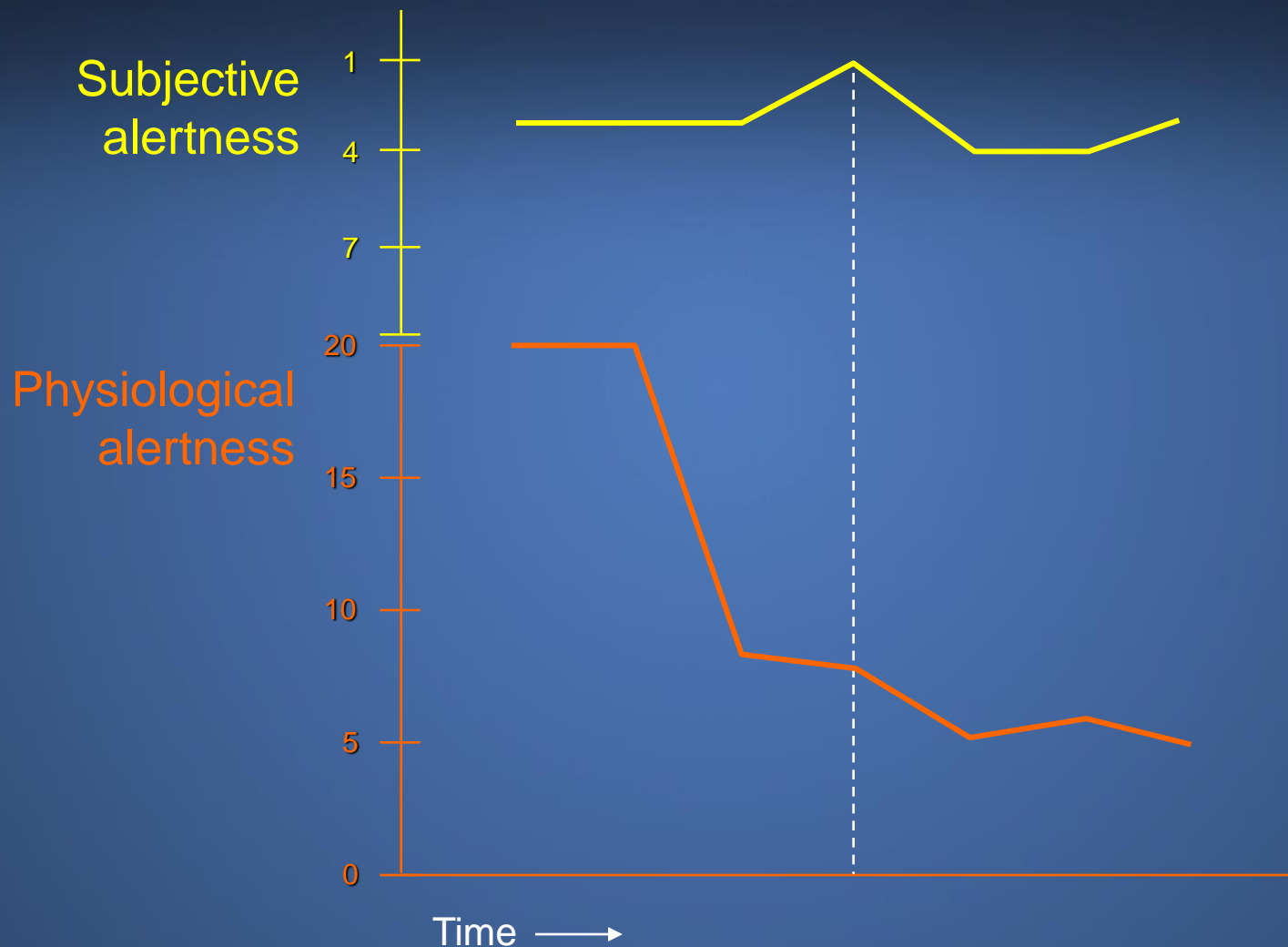
- irritability
- attentional lapses
- apathy
- microsleeps



Fatigue and Reaction Times



Alertness Reports Often Inaccurate



Adapted from Sasaki et al., 1986



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Uncontrolled In-Flight Collision with Terrain AIA Flight 808, Douglas DC-8-61, N814CK U.S. NAS, Guantanamo Bay, Cuba, August 18, 1993

First NTSB aviation accident investigation
to cite fatigue as probable cause

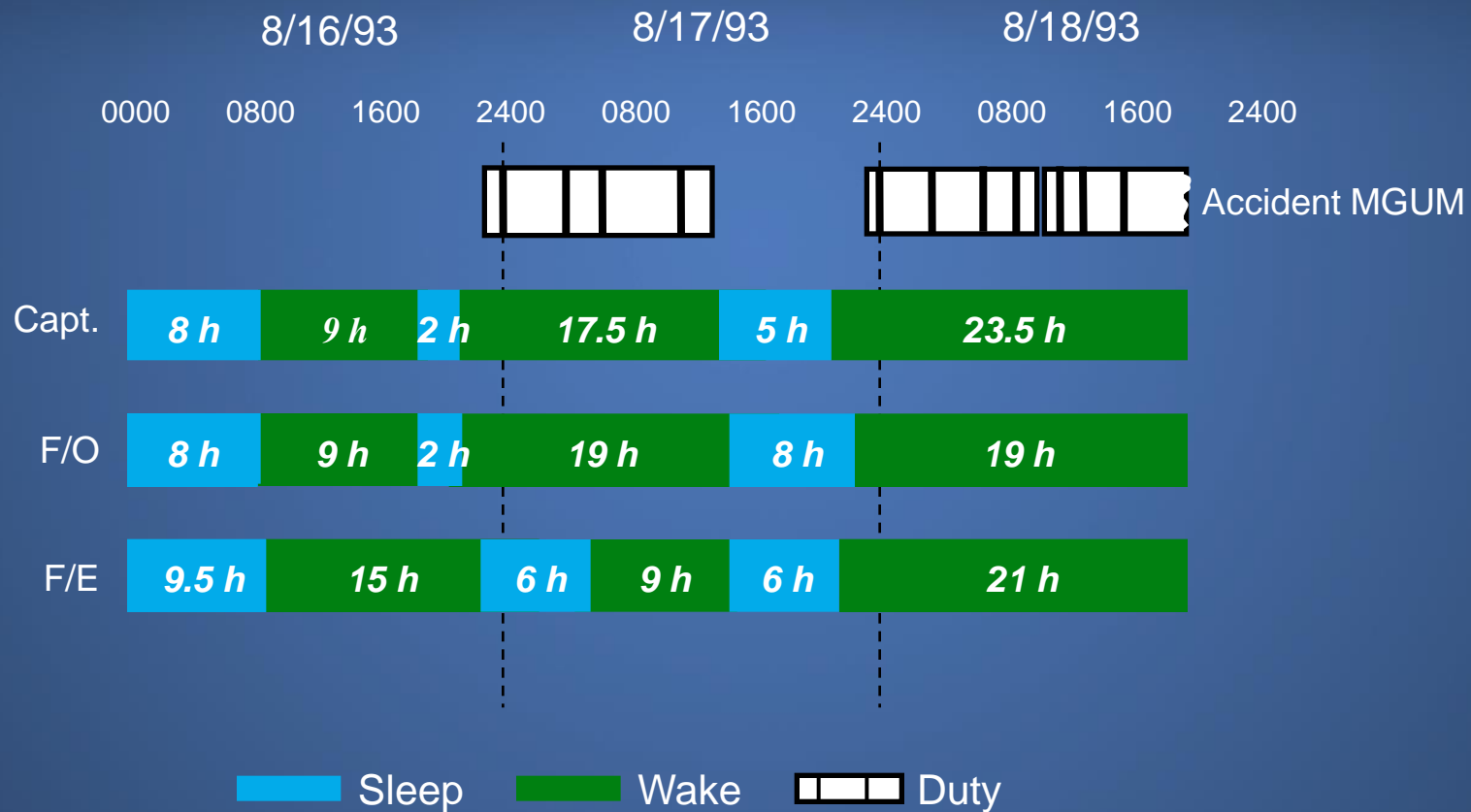


- acute sleep loss, sleep debt, circadian disruption



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Crew Sleep History



Observed Performance Effects

- Degraded decision-making
- Visual/cognitive fixation
- Poor communication/coordination
- Slowed reaction time





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Uncontrolled In-Flight Collision with Terrain
AIA Flight 808, Douglas DC-8-61, N814CK
U.S. NAS, Guantanamo Bay, Cuba, August 18, 1993

“The National Transportation Safety Board determines that the probable causes of this accident were the impaired judgment, decision making, and flying abilities of the captain and flight crew due to the effects of fatigue...”



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Owatonna, MN (July 31, 2008)



8 fatalities



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Probable Cause/Contributing Factors

“Contributing to the accident were . . .
(2) fatigue, which likely impaired both
pilots’ performance; . . .”



Asiana 214 (July 6, 2013)

San Francisco, CA (SFO)



3 fatalities
49 seriously injured



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Probable Cause

Contributing to the accident were . . .

(5) flight crew fatigue, which likely degraded their performance.



Fatal Aviation Accidents

(examples: fatigue cited)

- 8/97 Guam: 228 fatalities
- 6/99 Little Rock AK: 11 fatal
- 10/04 Kirksville MO: 11 fatalities
- 8/06 Lexington KY: 49 fatalities
- 7/08 Owatonna MN: 8 fatalities
- 2/09 Buffalo NY: 49 fatalities
- 6/09 Santa Fe NM: 2 fatalities
- 7/13 San Francisco, CA: 3 fatalities



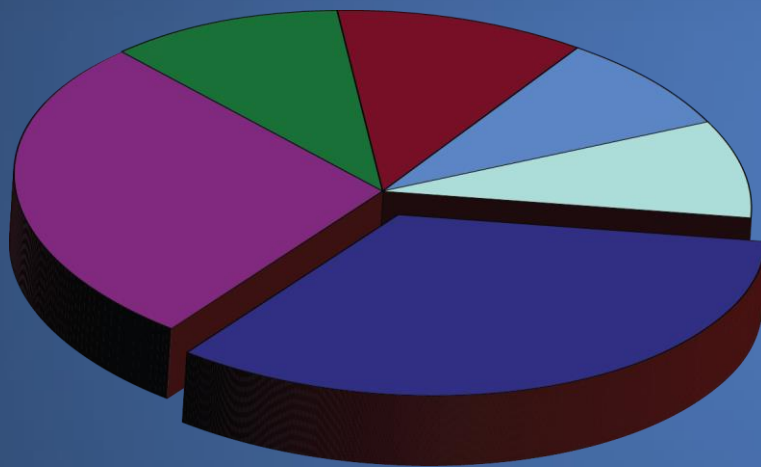
NTSB Recommendations

- MOST WANTED 1990 - 2011
- >200 fatigue recommendations



Complex Issue:

Requires Multiple Solutions



- Scheduling Policies and Practices
- Education/Awareness
- Organizational Strategies
- Healthy Sleep
- Vehicle and Environmental Strategies
- Research and Evaluation



Manage Fatigue = Enhance Safety

- Culture change
- Get educated
- Acknowledge risk
- Take action!



Good sleep, safe travels.



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